# DataMaster DMT Supervisor & Record Administrator Training

Presented by the Vermont Department of Health Laboratory DataMaster Technical Services

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## Course Goals and Objectives

- Understand responsibilities of a Record Administrator and Supervisor.
- Familiarization with the components and software protocols of the DataMaster DMT.
- Administrators will be able to provide copies of records as needed.
- Supervisors will be able to respond to error messages or conditions.
- Supervisors will be able to perform routine and simple maintenance and repairs.

## Access Levels

**Operator Level:** **No Password Required.**
Administer DUI and Check-In breath tests.
Copy last breath report generated.

**Administrator Level:** **Password Required.**
Access to all options available to an Operator.
Reprint breath reports not accessible when using the copy button.
Print copies of reports in response to discovery requests.
Generate "Summary Reports".
Export data as needed.

## Access Levels

**Supervisor Level:** **Password Required.**
Access to all options available to Operators and Administrators.
Perform "Simulator Solution Change".
Perform "Routine Performance Check".
Set Date and Time.
Perform "Diagnostic Test".
Perform "Accuracy and Precision Test".
View read-only Technician Screen.
Purge the Sample Chamber.
Remove/Return instrument to service.

**Technician Level: Only available to VDHL DataMaster Technical Services.**

## Record Administrator Duties

- Reprint copies of breath reports.
- Respond to discovery requests and/or provide monthly updates to the State's Attorney's Office.
- Download or export data.
- PASSWORD: DISCOVERY

## Supervisor Duties

- Maintain reports, records and logbooks.
- Maintain instrument security.
- Perform simple maintenance.
- Perform Routine Performance Checks.
- Maintain DataMaster supplies.
- Support DataMaster Operators.
- PASSWORD: CHALLENGER

## Log On Procedure

- Deactivate the screen saver.
- Tap the DataMaster DMT logo in the top left corner of the screen to open the drop-down menu *(options menu)*.
- Select "Security" → "Enter Password".
- Enter password.

## Log Off Procedure

- Open the options menu.
- Select "Security" → "Log Off".

## Record Administration

- Reprinting a Subject Test Breath Report
  1. Open the options menu.
  2. Select "Reports". Enter Password.
  3. Scroll down to "Breath Records" on right side of screen.
  4. Tap the + symbol next to "Breath Records".
  5. Records are sorted by date/time.
  6. Tap the + symbol next to the date desired.
  7. The test highlighted on the right will be displayed on the left.
  8. When the test desired is displayed, press "Print".
  9. When finished, Exit and Log Off.

## Record Administration

- Responding to discovery requests.
  - Only provide what is requested.
  - If your agency provides monthly updates, refer request to your State's Attorney's Office.
- Providing monthly updates.
  - Photocopies of both logbooks for the previous month
    - Operator Use Logbook (Alc 603).
    - Check Up and Maintenance Logbook (Alc 803).
  - Copies of any generated reports (RPCs, Simulator Solution Changes etc).
  - Generate Summary Reports.

## Record Administration

- Reprinting Reports.
  - Simulator Solution Change, Routine Performance Check, or Annual Preventative Maintenance reports can be reprinted from the DMT or photocopied from your onsite maintenance records.
  - To print a report from the DMT, access the "Reports" menu. Highlight the desired report. Press "Print". When finished, Exit and Log Off.

## Record Administration

- Providing Reports.
  - Only provide photocopies of the Calibration, Certification and Installation reports from your onsite maintenance records as those reports have been reviewed and signed by VDHL DataMaster Technical Services staff.

## Record Administration

- Generating Summary Reports
  1. Open the options menu.
  2. Select "Reports". Enter Password.
  3. Tap the DataMaster DMT logo in the top left corner of the reports screen to open the summary reports drop-down menu.
  4. Select "Breath Test Summary".
  5. Uncheck the "All Dates" box.
  6. Enter the dates for the data range desired.
  7. Press "Print"
  8. Repeat steps 4 through 7 for the "Status Summary" report.
  9. When finished, Exit and Log Off.

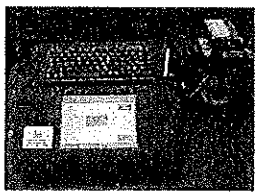
## Supervisor Functions

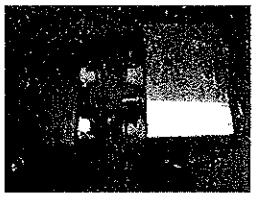
- Changing the Simulator Solution.
- Performing the Simulator Solution Change Protocol.
- Performing the Routine Performance Check Protocol.

## Supervisor Functions

- Set Date and Time.
- Diagnostic Test.
- Accuracy and Precision Check.
- View Technician Screen.
- Purge Sample Chamber.
- Remove from / Return to Service.

## Changing the Simulator Solution





## Changing the Simulator Solution

- Unplug and unlock the simulator.
- Disconnect the simulator head from the simulator tower.
- Unscrew the simulator head from the jar.
- Inspect the simulator mechanism, O-ring and jar.
- Replace the simulator solution.
- Thread the simulator head to the jar.

## Changing the Simulator Solution

- Plug the simulator in and ensure operation.
- Reconnect the simulator head to the simulator tower.
- Lock the arms around the simulator.
- Affix one solution label to the top of the simulator.
- Perform Simulator Solution Change or Routine Performance Check Protocol.

## Simulator Solution Change Protocol

- Open the options menu.
- Select "Protocols" → "Simulator Solution Change". Enter password.
- Input data (name, solution information) in required fields. Press OK.
- 30 Minute idle time…

## Simulator Solution Change Protocol

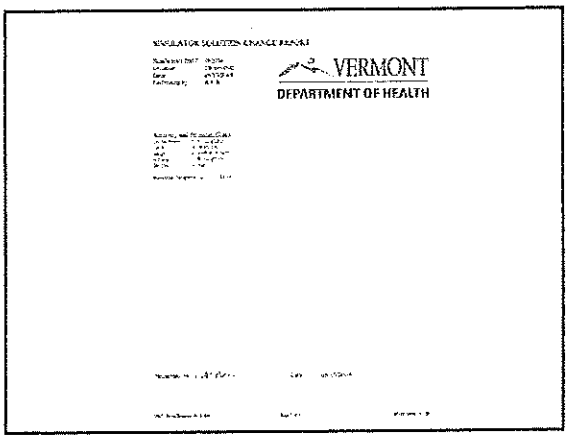
- The instrument will automatically begin an Accuracy and Precision Check.
  - Average result must be within ±5% of the certified value of the solution. The instrument will calculate this for you. The acceptable range will also be printed on the solution label.
  - Standard deviation must be less than 0.002.

## Simulator Solution Change Protocol

- Once a passing test is complete, sign in the box. Press "Finished".
- One copy of the Simulator Solution Change Report will print. File with your onsite maintenance records.
- Log Off.

## Simulator Solution Change Protocol

- Affix remaining simulator solution label to the Check Up and Maintenance Logbook (Alc 803). Under the label write "Simulator Solution Change". Date and sign where directed.
- In the Operators Logbook (Alc 603) write "Test/Simulator Solution Change" under "Subjects Name" and the average result from the Accuracy and Precision Check under "Ext. Std. 1".



## Routine Performance Check

- Must be performed every February, June and October.
- A reminder will be displayed during the month in which the RPC is due.
- If the RPC is not completed by the end of the required month, the instrument will automatically be removed from service until the RPC is completed.

## Routine Performance Check Protocol

- Open the options menu.
- Select "Protocols" → "Routine Performance Check". Enter password.
- Input data (name, solution information) in required fields. Press OK.
- 30 Minute idle time…

## Routine Performance Check Protocol

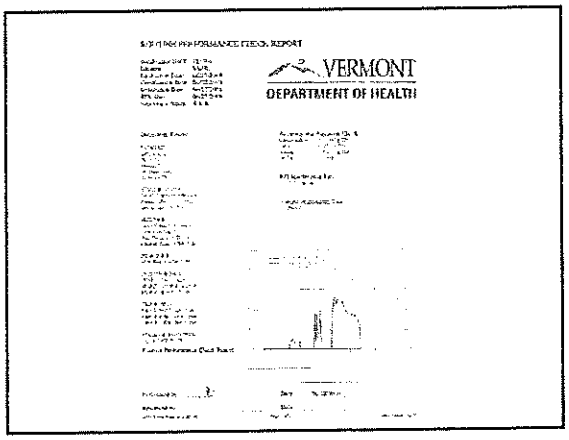
- Diagnostic Check.
- Accuracy and Precision Check.
- Radio Frequency Interference Test.
  - Console check (if applicable) and handheld radio check.
- Sample Acceptance Test.
  - Shallow, Intermittent, Suck Back, Alcohol Free breaths.
  - Select Yes or No if Sample Acceptance Test is passing or not.

## Routine Performance Check Protocol

- Once a passing test is complete, sign in the box. Press "Finished".
- Two copies of the Routine Performance Check Report will print.
  - File one with your onsite maintenance records.
  - Send one to VDHL DataMaster Technical Services.
- Log Off.

## Routine Performance Check Protocol

- Affix remaining simulator solution label to the Check Up and Maintenance Logbook (Alc 803). Under the label write "Routine Performance Check". Date and sign where directed.
- In the Operators Logbook (Alc 603) write "Test/RPC" under "Subjects Name" and the average result from the Accuracy and Precision Check under "Ext. Std. 1".



## Set Date and Time

- The DataMaster DMT automatically adjusts for leap year and daylight savings.
- There are two ways to access the date/time adjustment box.

## Set Date and Time

1. Double tap the date/time in the upper right corner of the "Ready, Push Run" screen. Enter password.

OR

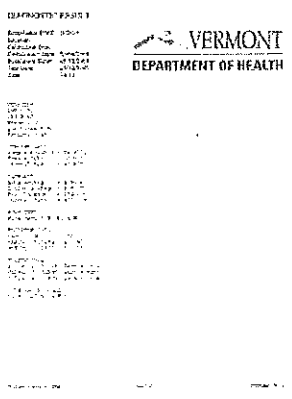
2. Open the options menu. Select "Functions" → "Set Date/Time". Enter password.

## Set Date and Time

- Highlight the field you wish to change and use the up/down arrow buttons to adjust.
- Once you have finished adjusting the date/time, press "Apply" to save the settings.
- Exit and Log Off.

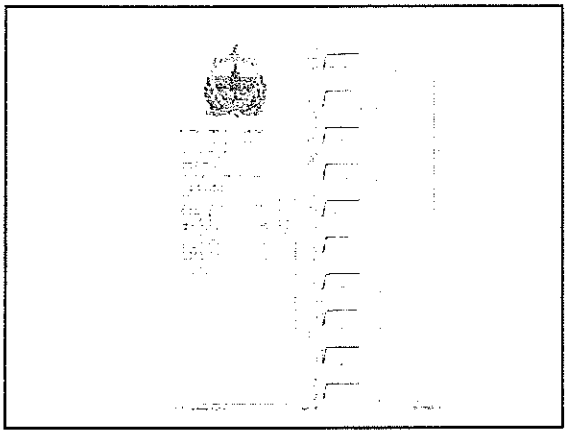
## Diagnostic Test

- Used during troubleshooting.
- The instrument checks software, hardware, optics and mechanical function.
- To perform a diagnostic test:
  - Open the options menu.
  - Select "Diagnostic". Enter password.
  - Once complete, Exit and Log Off.



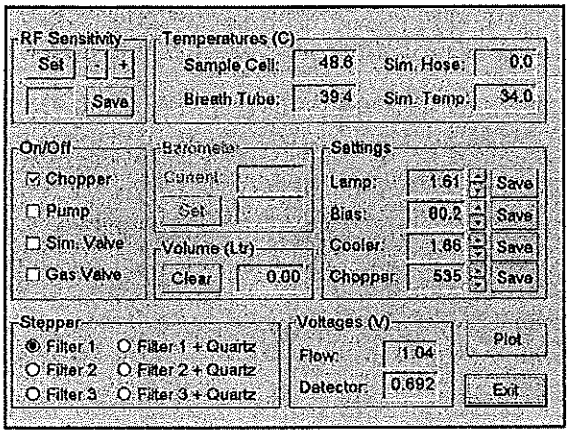

## Accuracy and Precision Check

- Used during troubleshooting.
- The DataMaster DMT will run 7 replicate samples of the simulator vapor and report the average concentration and standard deviation.
- To perform an accuracy and precision check:
  - Open the options menu
  - Select "Accuracy and Precision". Enter password.
  - Input data (name, solution information) in required fields. Press "OK".
  - Once complete, Exit and Log Off.



## Technician Screen

- As a method for troubleshooting, VDHL Technical Services may request you access the TECH screen and relay settings.
- To access the TECH screen:
  - Open the options menu
  - Select "Technician Mode". Enter password.
- When finished, Exit and Log Off




## Purge Sample Chamber

- Used during troubleshooting.
- The instrument will draw fresh air through the breath tube and into the sample chamber.
- To purge:
  - Open the options menu.
  - Select "Functions" → "Purge Sample Chamber". Enter password.
  - Allow the instrument to purge for 1-2 minutes unless otherwise instructed.
- When finished, Exit and Log Off.

## Remove From Service

- Open the options menu.
- Select "Functions" → "Remove From Service". Enter password.
- The screen will now display "NOT IN SERVICE!" where "Ready, Push Run" would be.
- Log Off.

## Return to Service

- Open the options menu.
- Select "Functions" → "Return To Service". Enter password.
- The screen will now display "Ready, Push Run" in the bottom left corner.
- Log Off.

## Printer Maintenance

- Each agency is responsible for supplying ink and paper for the printer.
- If the DMT displays "Printing" but nothing happens, ensure the ink/paper are full.
- If the DMT displays "Unable to establish communication to printer", check the USB cable connection at the DMT and the printer ports and ensure the printer is on.

## Troubleshooting

- Error Messages and Conditions are listed beginning on page 26 of your manual.
- All actions taken to remedy a situation should be documented your Check Up and Maintenance Logbook (Alc 803), even if you are unable to correct the error.
- Contact VDHL Technical Services will ALL error messages and conditions! (These are new instruments and we are monitoring their performance.)

## Practical Exercises

## Self Assessment

- Please complete the VDHL DataMaster DMT Supervisor Training Self Assessment.
- You may use your handouts, notes and training manual.

## Self Assessment Answers

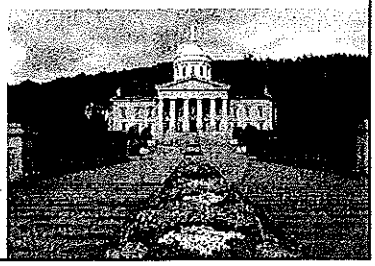
1. February, June and October
2. ±5% from the certified concentration.
3. Check the BNC connection to the simulator.
4. Simulator solution depletion.
5. C) Remove the mouthpiece, move the DUI subject, ventilate room and restart test.

## Self Assessment Answers

6. E) A and B only.
7. False.
8. True.
9. False.
10. False.

# Implementation of New Breath Testing Equipment

The DMT comes to Vermont!



## Vermont Department of Health Laboratory

Presented by Darcy Richardson

## A Little History

- Breath testing was performed in Vermont via GC analysis using the crimper system until economics and changing technologies paved the way for infrared.
- In 1990 the BAC DataMaster by National Patent Analytical Systems was installed into a test county.
- In 1996, the BAC DataMaster became the only evidential breath alcohol testing device in the state of Vermont.

## A Little History

- In 2006 the Vermont Legislature granted the Vermont Department of Health money to begin replacing the 1988 and 1995 BAC DataMasters used in the state.
- 4 Instruments were reviewed.

## A Little History

1) DataMaster DMT by NPAS, Inc.
2) Alcotest 7110 by Draeger.
3) Intoxylizer 8000 by CMI, Inc.
4) EC/IR II by Intoximeter.

## A Little History

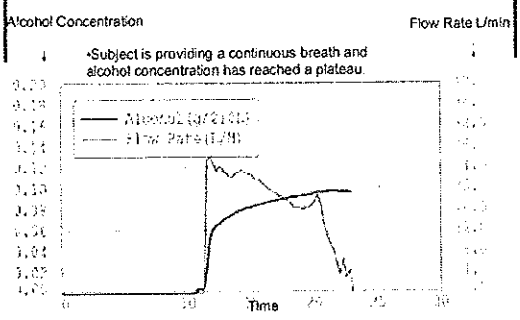
- After the initial review and testing of instruments the DataMaster DMT was chosen.
- 20 Instruments were ordered to be installed in three counties.
- This would allow the courts and officers to focus on only one instrument.

## The DMT

## The DMT

- The DMT uses Infrared Spectroscopy for analysis with filters at 3.37, 3.44 and 3.5 microns.
- The DMT software is built on a Windows CE framework.
- The user interface is based around a touch-screen color graphics display.
- A real time graphic representation of the breath profile is displayed.

## The Real Time Graphic




## The DMT Software

- The Windows CE platform allows a user friendly interface as well as allowing for software protocols that have not previously been used for this application.
- Vermont decided to push the limits of the software and automated all of the typical procedures used for up-keep and monitoring of the instrument.
- The Vermont DMT now prompts the user through all steps of our Standard Operating Procedures for 6 different protocols as well as automatically running tests when appropriate.

## The DMT Software

- Also attempted to preemptively address the common courtroom challenges in the software.

1. **Mandatory 15 minute Timer** to document the observation period. The clock may be restarted at which point the officer must provide a reason for doing so but can not be aborted or over-ridden at the operator level.

## The DMT Software

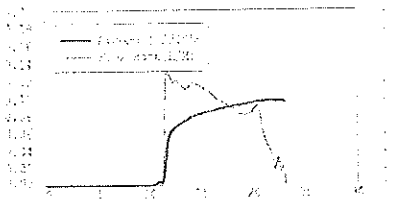
2. All attempts to provide a breath sample are recorded on the breath report even if they do not end in a successful test.

   -Helps to avoid the issue of whether the subject was "trying" or not.

3. The volume of each breath delivery is recorded which provides a more complete picture of the sample delivered.

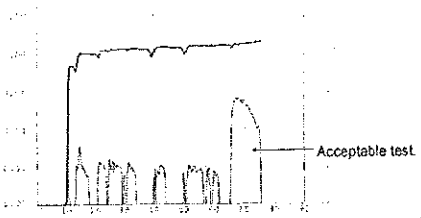
## Example Breath Profiles

Typical Breath and Alcohol Profile of a cooperative subject.



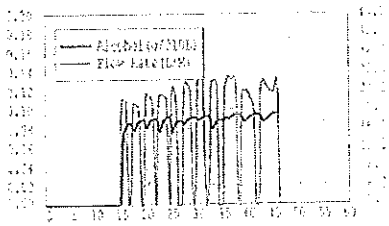
## Example Breath Profiles

- Subject may be trying to "beat the test" or is incapable of providing the minimum flow long enough.



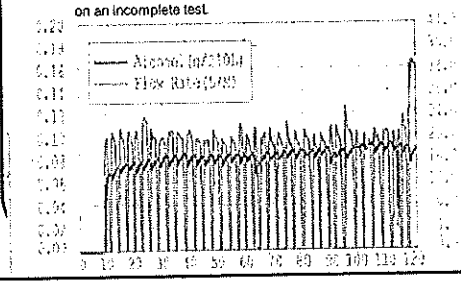

## Huffing and Puffing

- Subject may be uncooperative.



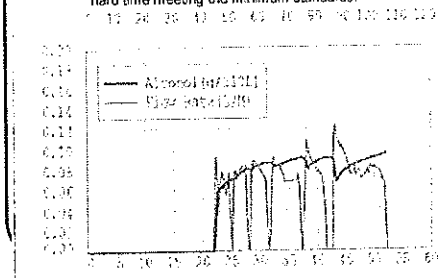
## Incomplete with Huffing and Puffing

- A valid test is never completed, however, please note that the alcohol concentration is never lower than an 0.07
- A minimum alcohol concentration may be determined even on an incomplete test.



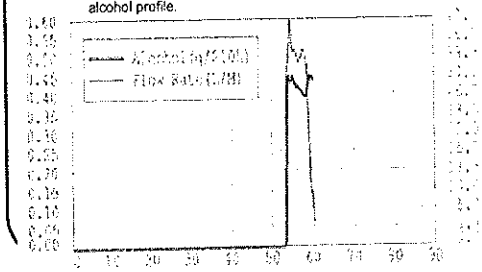
## Starting and Stopping

- This could be a sign that the subject is having a hard time meeting the minimum standards.

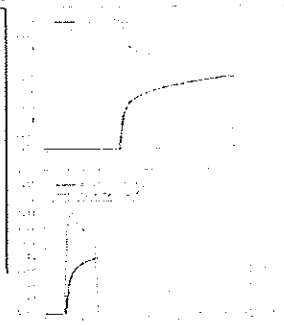


## Mouth Alcohol

- This is actual mouth alcohol in a drinking subject.
- There does not appear to be a "typical" mouth alcohol profile.



## Meeting vs. Exceeding



- One subject
- Consecutive breaths
- Graph 1: A full breath sample
  - Approximately 6.8L air
  - Alcohol result 0.099g/210L
- Graph 2: A partial breath sample
  - Approximately 1.7L air
  - Alcohol result 0.077g/210L

## Testing of the DMT

- Each instrument received has undergone stringent testing.


## Testing of the DMT

- **Power-Up Testing:**
- A quick test performed on receipt of the instrument which includes an accuracy and precision check, sample acceptance test, a subject test and a diagnostic test. An instrument failing a power-up test is returned to the manufacturer.

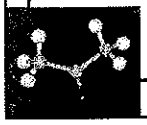

## Testing of the DMT

- **Linearity:** Each instrument had ten linearity tests run at nominal concentrations of 0.02, 0.08, 0.16, 0.40. Tests were run intra- and inter- day with $R^2$ values calculated for each set. $R^2$ was expected to be at least 0.99.
- **Accuracy and Precision:** Ten replicates of each concentration (0.02, 0.08, 0.16, 0.40) were run ten times totaling 100 tests of each concentration. Tests run inter- and intra- day as well as after periods of non-use.

## Testing of the DMT

- **Interfering Compound Testing:** The following mixtures were tested to ensure the accuracy of ethanol results when other potentially interfering compounds are present.

**0.01% Acetone in 0.08% EtOH**
**0.01% Acetone in 0.04% EtOH**
**0.02% Acetone in 0.04% EtOH**
**0.04% MeOH in Water**
**0.04% MeOH in 0.08% EtOH**
**0.04% Isopropanol in Water**
**0.04% Isopropanol in 0.08% EtOH**



## Testing of the DMT

- **Radio Frequency Interference Testing:** All instruments were tested for their ability to detect RFI and abort the test when detected.
- **Volume Testing:** The accuracy of breath volume measurements were compared with delivered volumes starting at 1.3 Liters and increasing to 2.0 Liters of air.

## Testing of the DMT

- **Mouth Alcohol Testing:** Simulated mouth alcohol was introduced to the instruments assuming a body burden of approximately 0.08 ethanol to ensure that "contaminated" breath samples would not be accepted.
- Additional monitoring of temperature zones, detector stability and software testing was performed. Some human subject testing was also performed using drinking subjects.

## Results

- **Linearity:** All $R^2$ values were at least 0.999 for all instruments.
- **Accuracy:** On average -1.7% with a range of +0.6 to -4.8%.
  Most difficulty with the 0.02 concentration where recoveries were often 5-10% low.
- **Precision:** Within 5% requirement at all levels.
  Larger (although still within range) variations seen at the 0.02 concentration.

## Interference Testing Results

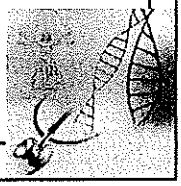
- Performed on 8 instruments as of 09/08.
- Ideally we wanted the instrument to abort all tests with interfering compounds present.
- Ability to detect the compounds showed some instrument to instrument variability.
- Overall was very good, flagging 1620/1722 tests. (94%)

## Interference Testing Results

- **0.01 Acetone in H2O:** 174/190 tests **(91%)**
- **0.02 Acetone in H2O:** 192/194 tests **(99%)**
- **0.01 Acetone in 0.08 EtOH:** 122/200 tests **(61%)**
- **0.01 Acetone in 0.04 EtOH:** 163/169 tests **(96%)**
- **0.02 Acetone in 0.08 EtOH:** 160/160 tests **(100%)**
- **0.02 Acetone in 0.08 EtOH:** 160/160 tests **(100%)**

## Interference Testing Results

- **0.04 MeOH in H20:** 160/160 tests (100%)
- **0.04 MeOH in 0.08 EtOH:** 160/160 tests (100%)
- **0.04 IPA in H20:** 160/160 tests (100%)
- **0.04 IPA in 0.08 EtOH:** 169/169 tests (100%)

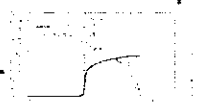


## RFI Testing Results

- Throughout testing the lab staff worked with NPAS to refine the radio frequency sensitivity and response.
- Instruments now appropriately abort tests when radio frequency (specifically those frequencies used by police radios) is detected near the instrument.

## Volume Testing

- Lab staff worked with NPAS to optimize the accuracy of the breath volume measurements.
- Volume measurements are affected slightly by flow rate.
- Current results indicate volume accuracy within +/-0.2 Liters.



## Mouth Alcohol Testing

- "Mouth Alcohol" of 0.40 ethanol concentration was blown through a simulator of 0.08 ethanol concentration.
- The instruments called such tests "Invalid Sample" when a decrease in alcohol concentration was evident.
- This continued until numbers were reported again. These numbers once reported were not improperly inflated.

## Implementation

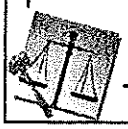
- In June of 2008, toxicology staff trained approximately 70 officers from two counties.
- Initial counties were Franklin and Grand Isle County.
- Chosen for experienced prosecutors, high numbers of DUI arrests and proximity to the laboratory.

## Implementation

- Officers were given an addendum certification to their original DUI Enforcement Certification through the Vermont Criminal Justice Training Council.
- 4 Hours of class instruction which included lecture, practice tests, a written test and practical reviewed by toxicology staff.

## Implementation

- State's Attorneys were given a presentation on the DMT and reports that they would expect to see.
- Explanations of breath profiles and how the instrument meets current Rules and Regulations.



## Implementation

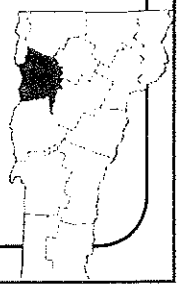
- On July 1st, 2008 6 instruments were deployed into Franklin and Grand Isle Counties.
- Approximately 85 subjects have been processed on the new instruments.
- No cases litigated as of September 2008.

## Errors Encountered

1. 2 Pump error messages. (situation is being monitored)
2. 1 Simulator issue. Simulator was not threaded properly onto the simulator body resulting in quicker depletion of solution.
3. 1 instance of required fields not being saved to the memory. (NPAS software programmer reviewed, appears to be an anomaly.)

## Future Plans

- In October of 2008, we will begin training 350 officers for deployment in Chittenden county.
- 11 Instruments to be deployed the first week of November 2008.

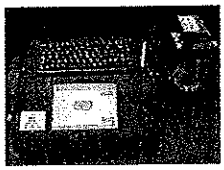


## Thank you for your attention!

Any questions?

## DataMaster DMT State's Attorney Course

VERMONT
DEPARTMENT OF HEALTH



## Why are we here?

- To train Vermont prosecutors on the DataMaster DMT and how to effectively use the information it generates in the courtroom.

## The DMT

- Appears on the Federal List of Conforming products for evidentiary breath testing.
- Is currently being used in New York.
- VT was the first state to use the graphing capability. SC and IA now use it as well.
- At present time Vermont has the most sophisticated DMT software protocol in use.

## What is the Same?

- It is still a DataMaster.
- It is produced by the same manufacturer National Patent Analytical Systems (NPAS).
- It still uses infrared spectroscopy.
- It still meets the current rules and regulations.
- It still performs the same checks.

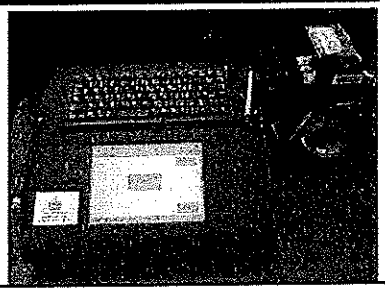
## What is Different?

- It uses three filters as opposed to two. (3.37, 3.44 & 3.5.)
- It is a Windows CE based system.
- It uses a touch screen.
- It displays breath flow and alcohol concentration in real time.
- It uses an external printer so reports will be 8.5"x11".
- Software is more sophisticated.

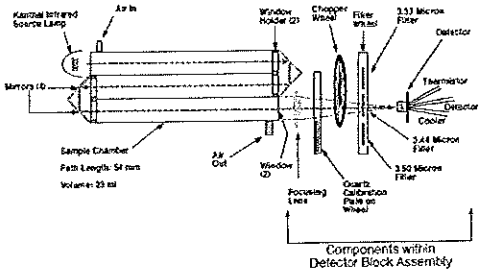
## What is Different?

- The Internal Standard indicates "Passed" or "Failed."
- The external standard is now called "Simulator Vapor".
- The simulator vapor has an acceptance of 5% from the certified value.
- The observation period is built in.
- RPC's are mandatory in the software.
- The breath tube temperature is monitored.
- The three breath reports are identical.

## The DataMaster DMT

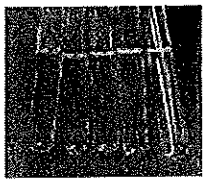


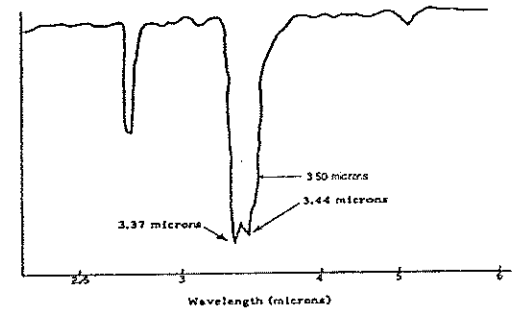
DATAMASTER DMT OPTICAL BENCH




Components within Detector Block Assembly

- The more ethanol present in the breath, the more infrared energy is absorbed, the less IR energy that reaches the detector.





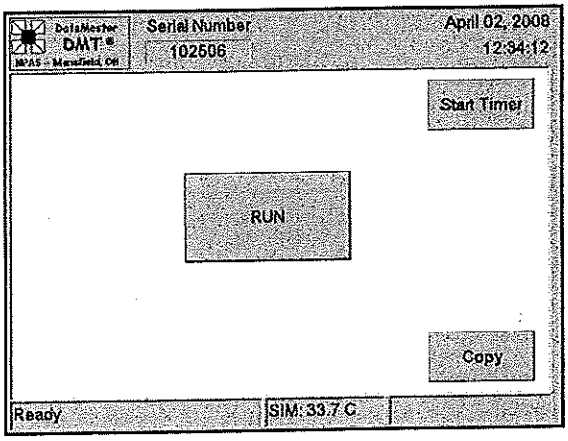

INFRARED SPECTRUM OF ETHYL ALCOHOL.

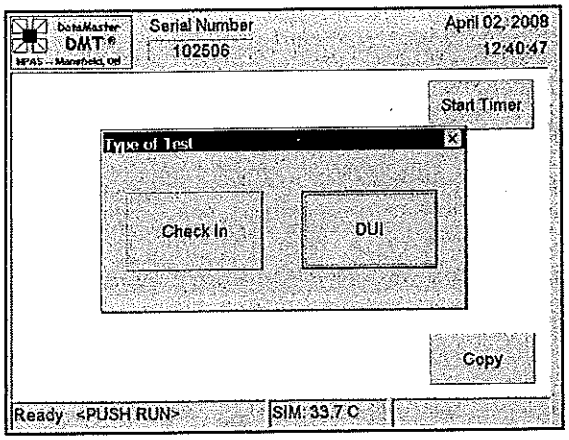
## The Testing Procedure

Touch

**RUN**

on the screen



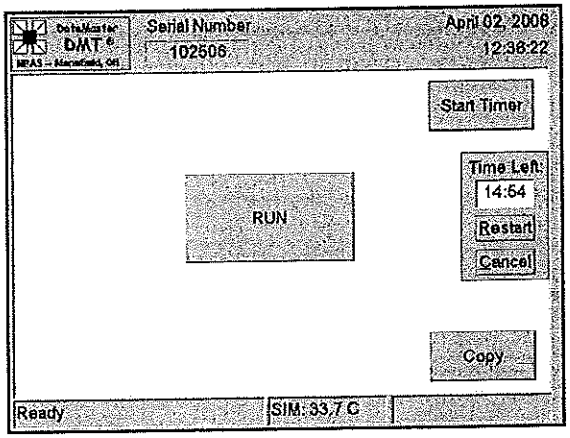



## DUI vs. Check-In Confirmation

- The DUI selection requires greater information and a 15 minute observation period. A two test sequence is available.
- The Check-In selection only requires subject and officer information. There is no observation period and it is only a one test sequence.

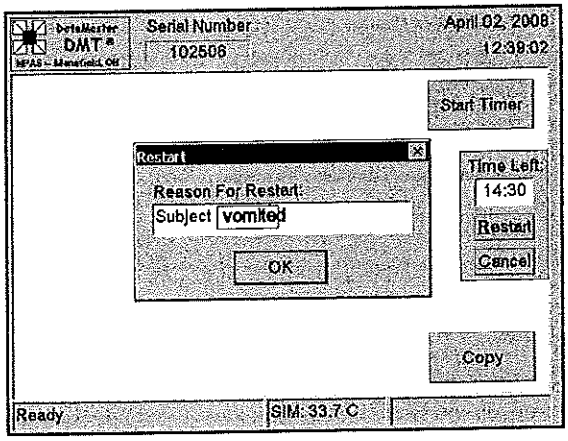
## 15 Minute Observation Clock

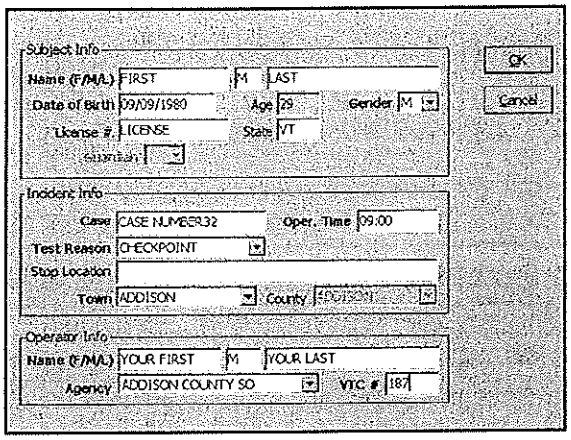
- The DMT has a built in 15 minute observation timer which must be completed before a DUI test can be performed.
- The officer may begin the 15 minute timer before they press the RUN button.
- If they do not start the timer before they press the RUN button, they will be prompted to start it once all the case information has been entered.

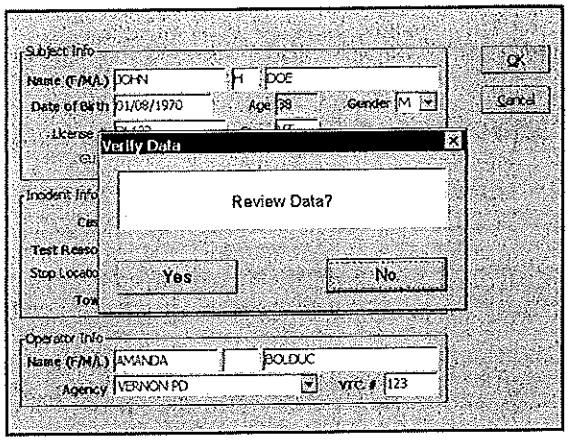



## 15 Minute Observation Clock

- If the clock is restarted they will be prompted to enter a reason for restart.
- This can be as simple as "Subject Vomited" or "Subject spoke to an attorney."
- **What ever they enter will be printed on the DUI Report.**

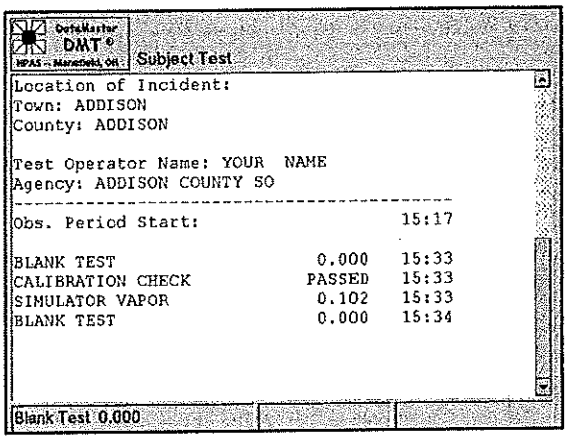


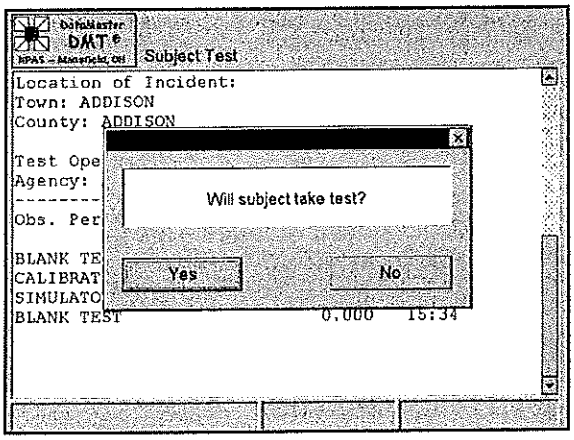



## System Checks

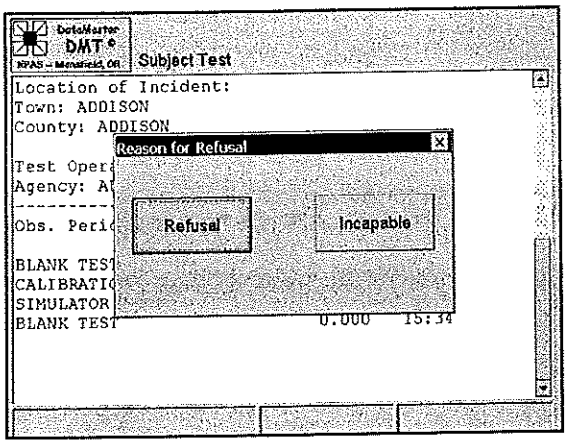
Purge
Ambient Zeroing
Blank Test ← 0.000
Calibration Check ← PASSED
Simulator Vapor ← ~0.100 +/- 5%
Purge
Ambient Zeroing
Blank Test ← 0.000

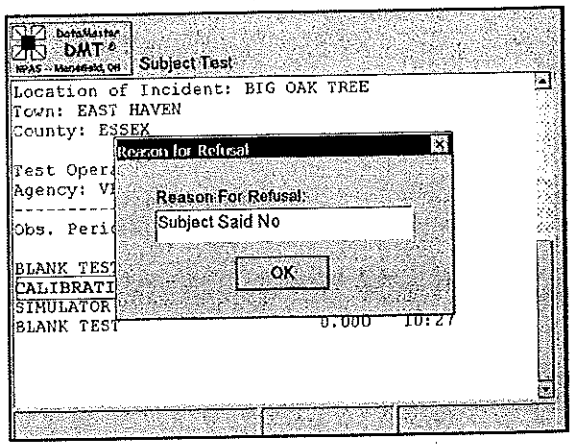



## Refusals/Incapable

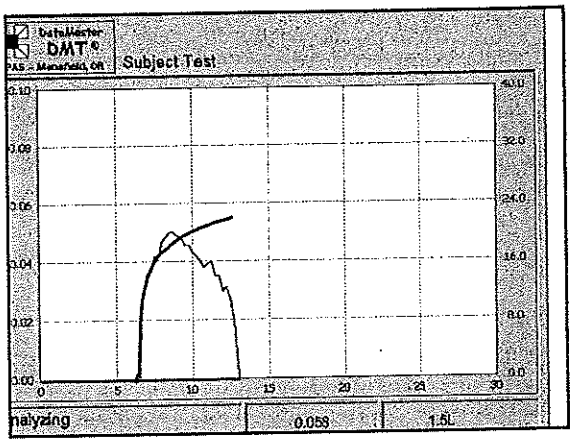
- If the Officer selects "No." They may now explain whether it is a refusal or whether the subject is incapable of providing a breath sample.



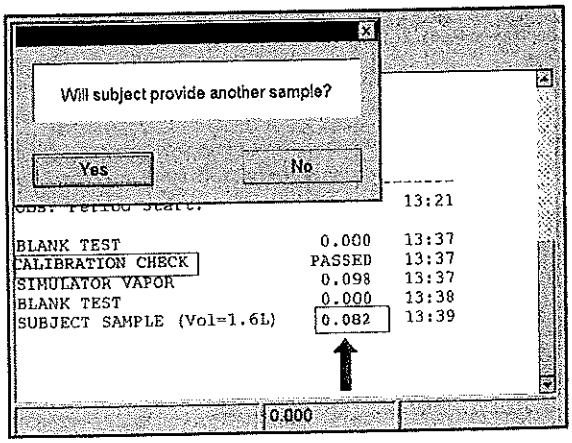

## Taking The Test

- If the officer selects "Yes" to Subject Take Test. The instrument will beep and display "Please Blow."
- The subject must meet the minimum flow rate, provide at least 1.5 liters of air and reach a plateau in alcohol concentration.



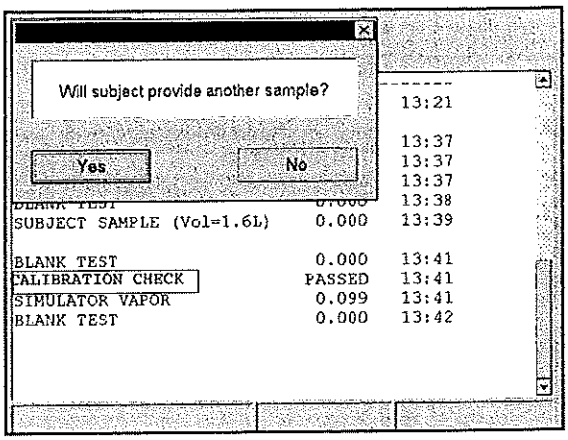

## Taking The Test

- Once the sample is analyzed, the DMT will display the subject's alcohol concentration.
- The officer will inform the subject of their results and ask if they want a second test.
- The instrument will prompt "Will subject provide another sample?"



## Taking A Second Test

- If No is selected the test sequence ends.
- If Yes is selected the instrument will again go through it's quality control tests.
  - Purge
  - Ambient Zeroing
  - Blank Test
  - Calibration Check
  - Simulator Vapor
  - Purge
  - Ambient Zeroing
  - Blank Test

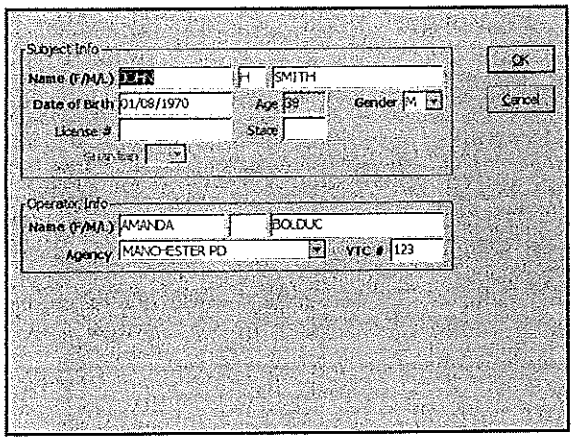


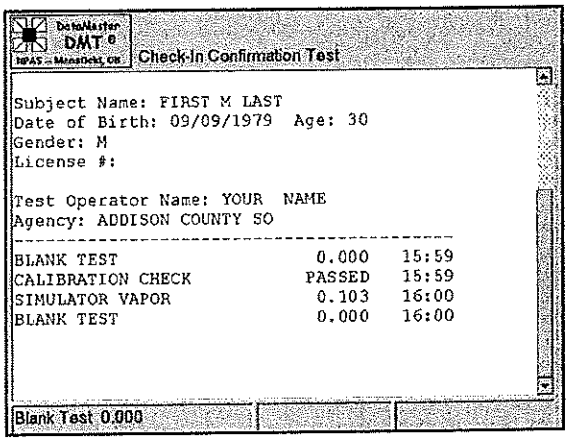

## Taking A Second Test

- Once the test sequence is complete, three copies of the report are printed.
- One copy is for the State's Attorney, one for the arresting officer, and one for the subject.

## The Check-In Test

- This option is available when a person reporting for check-ins has blown numbers on the PBT and the court has ordered the failures to be confirmed by DataMaster.



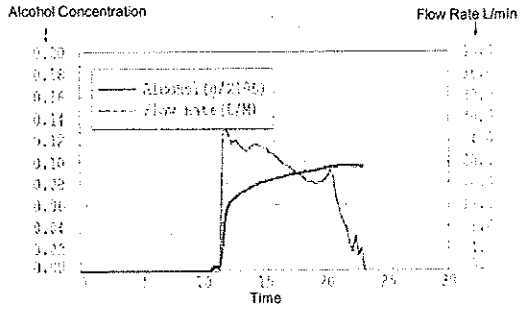
## Interpreting the Reports

## Breath Profiles

- As the subject is blowing, the DMT will display the breath and alcohol profiles in real time.
- Whatever the Officer observed on screen during the test will be printed on the report.
- The following slides are examples of actual breath profiles you might encounter.

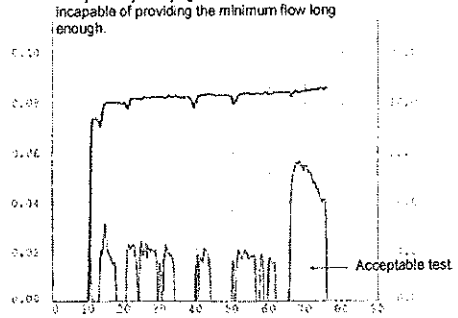
## Typical Breath and Alcohol Profile

•Subject is providing a continuous breath and alcohol concentration has reached a plateau.



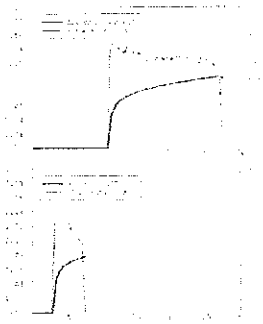

## Low Flow

•Subject may be trying to "beat the test" or is incapable of providing the minimum flow long enough.




Sample provided through a simulator.

## Meeting vs. Exceeding



•One subject
•Consecutive breaths

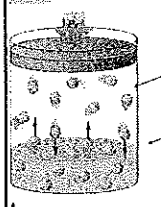
•Graph 1: A full breath sample
  •Approximately 6.8L air
  •Alcohol result 0.099g/210L

•Graph 2: A partial breath sample
  •Approximately 1.7L air
  •Alcohol result 0.077g/210L

## Science Segue!

### Henry's Law

- *In a closed system, at a given temperature, there is a fixed ratio between the concentration of a volatile in a liquid and in the air above the liquid.*



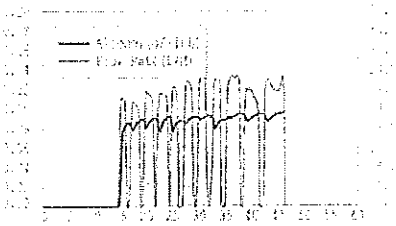

Therefore, the ethanol concentration in the blood is at equilibrium with the ethanol concentration in the breath.

## Science Segue!

- The human body is NOT a closed system
- Therefore, the air in the **bottom** of the lungs will be closest in concentration to that found in the blood.
- We want to sample the air **closest to the blood**, **highest in concentration**.
- Air in the upper portion of the lungs is constantly being diluted by room air and is biased low.

## Huffing and Puffing

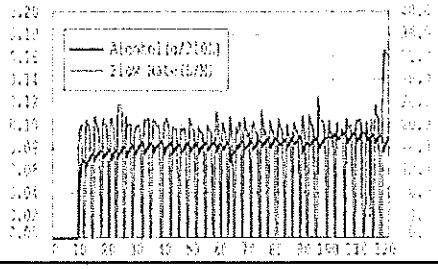
•Subject may be uncooperative.



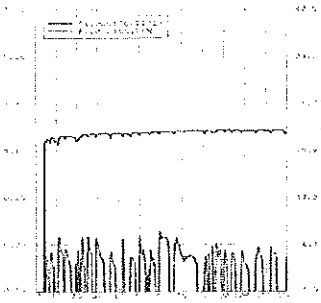
## Incomplete with Huffing and Puffing

•A valid test is never received, however, please note that the alcohol concentration is never lower than an 0.07.

•A **minimum alcohol concentration** may be determined even on an incomplete test.



## Incomplete: 2x Legal Limit

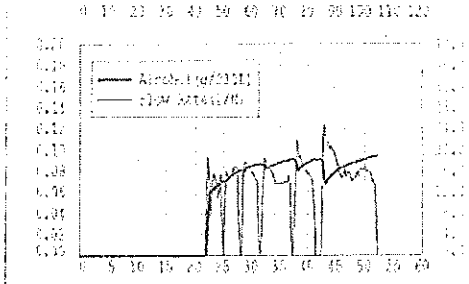


•A **minimum alcohol concentration** may be determined even on an incomplete test.

Sample provided through a simulator.

## Starting and Stopping

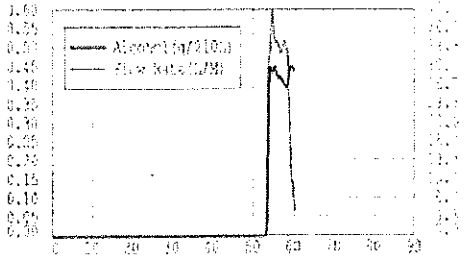
•This could be a sign that the subject is having a hard time meeting the minimum standards.



## Mouth Alcohol

•This is actual mouth alcohol in a drinking subject.

•There does not appear to be a "typical" mouth alcohol profile.



## What is Mouth Alcohol?

- Mouth Alcohol is alcohol that is not a reflection of the alcohol in the blood
- Mouth alcohol is unlikely in a DUI processing unless vomiting of alcohol-containing stomach contents or ingestion of alcohol-containing substances occurs immediately before the test.

Drinking or rinsing with alcohol, some remains in the mouth.

Vomiting if there is alcohol in the stomach will leave mouth alcohol.

## Important to Remember

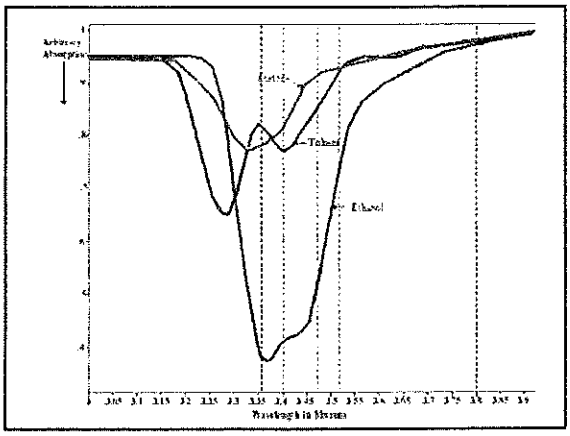
- Even when a test is incomplete, a minimum alcohol concentration may be available on the graph.
- The graph shows a direct picture of how the subject was providing their sample. (Were they cooperative? Were the incapable? Were they messing around?)

## A note about Invalid Samples

- An "Invalid Sample" message is displayed when an abnormal breath profile has been obtained during sample delivery.
- The algorithm used to determine an invalid sample is more sophisticated than that used in the BAC DataMaster.
- We expect to see much fewer "Invalid Sample" messages than we currently receive with the BAC DataMaster.

## A note about Interferences

- An "Interference" message occurs when the ratio between the measurements at the three filters is not what is expected for ethanol.
- Multiple instances of "Interference" during the subject sample may indicate that an apparent interferant is present.



## Data Collection

- Data Collection is set to on.
- Discovery requests can be processed at the DMT agency.
- Each DMT can produce it's own discovery reports without the addition of any software or the use of an intermediate computer.
- Breath Curves will not appear on the discovery reports, only on individual test reports.

## TIMELINE

- Officers in Franklin and Grand Isle Counties received training in May and have been using the DMT since July 2008.
- DMT's were installed in Chittenden County on November 12th, 2008.
- Installation of DMT's into Washington County is taking place in December 2009.
- Windham County will follow in January 2010.
- Plans are in place for Lamoille, Addison and Orleans Counties.

## ANY QUESTIONS?

Thank You!